UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2003/01042

April 30, 2004

Mr. Lawrence C. Evans
U.S. Army Corps of Engineers
Attn: Kathryn Harris
Portland District, CENWP-CO-GP
P.O. Box 2946
Portland, OR 97208-2946

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Venture Properties, Inc. Sewer Line and Stormwater Outfall, Cedar Creek, Tualatin River, Washington County, Oregon (Corps No. 200300319)

Dear Mr. Evans:

Enclosed is a biological opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) for the issuance of a permit under section 404 of the Clean Water Act to authorize construction of a sewer line and stormwater outfall by Venture Properties, Inc., in Cedar Creek, Tualatin River, Washington County, Oregon. The Corps of Engineers (COE) has requested formal consultation on this action, and determined that the action may adversely affect Upper Willamette River (UWR) steelhead (*Oncorhynchus mykiss*) and UWR chinook (*O. tshawytscha*). NOAA Fisheries concludes in this Opinion that the proposed action is not likely to jeopardize the continued existence of the above-listed species.

Pursuant to section 7 of the ESA, NOAA Fisheries has included reasonable and prudent measures with non-discretionary terms and conditions that NOAA Fisheries believes are necessary and appropriate to minimize the potential for incidental take associated with this project.

This document also serves as consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and its implementing regulations (50 CFR Part 600). NOAA Fisheries concludes that the proposed action will adversely affect designated EFH for coho salmon and chinook salmon. As required by section 305(b)(4)(A) of the MSA, included are conservation recommendations that NOAA Fisheries believes will avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from the proposed action. As described in the enclosed consultation, 305(b)(4)(B) of

the MSA requires that a Federal action agency must provide a detailed response in writing within 30 days after receiving an EFH conservation recommendation.

Questions regarding this letter should be directed to Christy Fellas of my staff in the Willamette Basin Habitat Branch of the Oregon State Habitat Office at 503.231.2307.

Sincerely,

for Michael R Course

D. Robert Lohn
Regional Administrator

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Venture Properties, Inc. Sewer Line and Stormwater Outfall,
Cedar Creek, Tualatin River,
Washington County, Oregon
(Corps No. 200300319)

Agency:	U.S. Army Corps of Engineers
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	April 30, 2004
Issued by:	for Michael R Crouse _____ D. Robert Lohn Regional Administrator
Refer to:	**2003/01042**

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1. INTRODUCTION

1.1 Background

On August 13, 2003, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a letter from the U.S. Army Corps of Engineers (COE) requesting informal consultation pursuant to the Endangered Species Act (ESA) for the issuance of a permit under section 404 of the Clean Water Act to Venture Properties, Inc, to allow construction of a sewer line and stormwater outfall in connection with a new residential subdivision, near Cedar Creek, a tributary of the Tualatin River in Washington County, Oregon. The COE determined the proposed action was not likely to adversely affect (NLAA) UWR steelhead (*Oncorhynchus mykiss*). NOAA Fisheries responded in an October 2, 2003 letter, indicating non-concurrence with the NLAA determination and suggested that the COE request formal consultation and requested additional project information. The COE requested formal consultation and supplied additional information in a letter received by NOAA Fisheries on November 17, 2003.

NOAA Fisheries listed UWR steelhead under the ESA as threatened on March 24, 1999 (64 FR 14517). Protective regulations for steelhead and chinook were designated on July 10, 2000 (65 FR 42422). The objective of this Opinion is to determine whether the proposed action is likely to jeopardize the continued existence of the ESA-listed species. This consultation is conducted pursuant to section 7(a)(2) of the ESA and its implementing regulations, 50 CFR 402.

1.2 Proposed Action

Sewer Line

The Bluffs at Cedar Creek residential development project is on the uplands of the west slope of Cedar Creek. To connect to the CWS sewer main in the degraded wetland on the east side of Cedar Creek, a temporary (five working days) cofferdam will be constructed during the in-water work window of July 1 to September 30 to isolate sewer line trenching activities and the associated potential negative impacts to Cedar Creek. The proposed sewer line connection to the existing Clean Water Services' (CWS) sewer in the wetland on the east side of Cedar Creek will be through open trench installation. Open trench installation is the only feasible construction method due to steep slopes beside the wetland and creek. A silt fence will be set at the limits of the construction/disturbance area. To isolate the segment of creek under construction, the contractor will set up a cofferdam made of sand or bladder bags. Cofferdam construction is dependent on water levels/flows at time of construction. Stream flow will be diverted around the cofferdam area via appropriately-screened dewatering pumps and 12 inch flexible diversion hose/pipe. The contractor will excavate the trench and stockpile material to be placed back in the trench. Stockpiled material will be placed linearly along the trench to minimize disturbed area. Excess trench spoil material will be removed to an upland area.

A temporary trench/shoring box will be used to keep the excavation width of the trench to a minimum. Granular backfill will be placed in the pipe zone (bottom of the trench to 12 inches above the pipe) to encase the pipe in gravel. Above the pipe zone, the stockpiled native

materials will backfill the trench. Water that seeps or accumulates in the sewer line trench during construction will be pumped to an upland area and discharged to a temporary sedimentation pond with outflow directed to a filter/vegetated strip before release to the wetland area. Construction equipment will be selected to have low ground pressure impacts and the disturbance area will be kept to a minimum. Disturbed areas will be returned to their pre-existing elevation. The cofferdam, silt fence and all construction-related materials, such as excess soil, sand bags, *etc.*, will be removed following sewer line connection. Mitigation plantings and groundcover will be installed as per the sewer easement planting plan. The duration of the sewer line connection work is estimated to be five working days.

Fish Salvage

Fish salvage activities will be conducted by biologists during the in-water cofferdam isolation for sewer line construction and connection to the existing CWS sewer main. It is highly unlikely that listed steelhead juveniles will be present in the project area during the proposed in-water work due to the high stream temperature and poor habitat conditions found in Cedar Creek. However, there may exist a very small potential that listed steelhead could be present, and therefore could be entrained within the isolated work area. This fish salvage operation will be implemented in order to protect, relocate, and return any ESA-listed fish that may occur in the isolated waters of Cedar Creek.

Once the cofferdam is constructed, a fish biologist will visually search the isolated area for fish presence and to estimate the needs for salvage before dewatering. Full-spanning 3/32-inch mesh seines and dip nets will be used to capture fish within the isolated cofferdam area before and during dewatering, until all fish are removed from the isolated work area. All fish will be removed before completion of dewatering actions. All dewatering pumps will be screened with 3/32-inch mesh as stated in the conservation measures of the BA.

Should it be determined in the field that seines and nets are not sufficient to rescue all fish from the isolated work area, backpack electrofishing may be used. Backpack electrofishing will be conducted according to NOAA Fisheries' backpack electrofishing guidelines (2000) under the supervision of an experienced fishery biologist with substantial electrofishing experience. Electrofishing will be conducted using a Smith-Root 15D backpack electrofisher before and intermittently during the pump diversion of waters within the sewer line cofferdam isolation area. Electrofisher settings will be chosen to minimize the risk of injury to fish. As a consequence of the anticipated low voltage settings (<700 volts) and difficult visibility and depth conditions anticipated, several passes may be needed to remove the fish from the isolated work area. The project site will be revisited after pumping commences to capture remaining fish as water levels recede in any remaining deeper pools of the isolated work area.
Captured fish will be placed in buckets of streamwater and allowed to recuperate before being released back to Cedar Creek upstream and outside of the sewer line construction area. Handling of fish will be limited to minimize stress and reduce mortality. Adequate temporary screens (NOAA Fisheries' diversion screening guidelines) will be left in place on all operating dewatering pumps in order to prevent fish from potential pump entrainment. Weather, air

temperatures, stream water temperatures, and conductivity will be measured before electrofishing.

Results from the rescue/salvage of fish will be submitted with a summary of the numbers, sizes, and condition of captured vertebrates. Any fish mortality during the salvage operation will be reported with notes on any contributing conditions.

Stormwater

Infiltration and Detention

Infiltration of stormwater is not practicable in this area of Washington County because of the soil types present in the project area. Soils in the area to be developed are predominantly Hillsboro loam on 3 to 12% slopes and the very steep Xerochrepts and Haploxerolls. Xerochrepts and Haploxerolls have a high erosion hazard and characteristic seeps and wet spots, as can be seen in areas of small landslides along the slope above Cedar Creek. This slope will be re-graded and landscaped to prevent further landslides and discharge of sediment into Cedar Creek. Any infiltration potentially occurring in the flat area upslope of the hill slope would increase the water in seeps along the slope, exacerbating the erosion hazard. Hillsboro loam units are also listed as having limited potential for drainage due to slopes, seepage, low percolation rates, and low strength.

The proposed project is at the downstream end of Cedar Creek. Detention of stormwater on the project site would cause release of stormwater from the development concurrent with the release of detained water from upstream facilities, increasing the magnitude of peak flows while decreasing the duration of peak flow events. Treatment and discharge into Cedar Creek without detention would prevent increasing peak flows in the creek.

Federal Emergency Management Agency flood insurance studies show a 25-year peak flow of 1350 cubic feet per second (cfs) in Cedar Creek at the existing culvert crossing under Highway 99, slightly upstream of the project site, and calculations (Santa Barbara Urban Hydrograph) yielded a peak flow of 1462 cfs from the entire Cedar Creek basin for the 25-year storm. The project will only increase the 25-year discharge from the site from 1.94 cfs to 3.28 cfs. Using the peak flow of 1350 cfs, the percent increase to Cedar Creek is only 0.10%. Additionally, the slope near Cedar Creek is very steep and does not allow enough space to create a detention area. The project proponent is not proposing any detention onsite as part of the proposed action.

Proposed Stormwater Systems

Clean Water Services (CWS), a local jurisdiction, requires all stormwater systems to remove 65% of the total phosphorous from the runoff from 100% of newly-constructed impervious surfaces at the Water Quality Design Storm (0.36 inches over 4 hours with a return of 96 hours). The original bioswale design met the CWS total phosphorus requirements. Generally, oil and water separators are applicable for areas with potentially high concentrations of oil, including commercial and industrial areas (petroleum storage yards, vehicle maintenance facilities, *etc.*), parking lots at shopping malls, and other high-use sites. Oils are not expected to be in high concentrations in residential development. Oil and water separators are not proposed for the

development, as the City of Sherwood does not approve of their use in the public storm system, and conditions do not warrant their use. Pretreatment in a sump can be provided at the water quality manhole before discharging to the bioswale. Bioswales are designed to remove low concentrations of total suspended solids (TSS), heavy metals, petroleum hydrocarbons, and/or nutrients from stormwater.

Treatment of the 6-month, 24-hour storm for water quality
The bioswale has been re-designed to treat the NOAA Fisheries (2003) water quality design storm. Treatment will occur in a 125-foot long, 14-foot wide bioswale sized for the water quality design storm. All design specifications are greater than the minimum required by Clean Water Services to achieve water quality treatment (removal of 65% of phosphorous from 100% of newly-created impervious surfaces). The biofiltration swale is designed to remove low concentrations of total suspended solids (TSS), heavy metals, petroleum hydrocarbons, and/or nutrients from stormwater (2001 WA Dept of Ecology).

Velocity of Discharge Water Released from Outfall
Peak velocity of the discharge water from the enlarged water quality swale proposed storm system was computed to be 4.3 feet per second for the 25-year design storm. A riprap outfall pad designed to meet Clean Water Services' energy dissipation requirements for the computed peak water velocity will be installed beside Cedar Creek. The outfall will be constructed of ODOT class 50 riprap, 1.5 feet thick, 7 feet wide and 8 feet long. The outfall will be planted with willow stakes to improve wildlife habitat. The outfall pipe slope has been minimized by lowering the upstream manhole invert in order to reduce velocity at the riprap pad. The outfall pipe material was changed to an aluminized, corrugated metal pipe with a higher Manning's roughness, which further reduced the outfall velocity.

Facility Maintenance Plan
The following measures were included in the water quality facility maintenance plan submitted by the applicant:

- Inspection of the entire facility: Monthly.
- Watering and fertilizing plants: As needed to establish plants.
- Planting, reshaping, replanting: As needed.
- Garbage removal: As needed.
- Inlet/outlet maintenance: Once per year, or as necessary.
- Bank, wall and fence maintenance: As needed.
- Trimming: Four to six times per year.

Additional Measures within the Development
To minimize impervious surfaces within the proposed development, the engineer received a variance to reduce road width within the development from the City of Sherwood standard 32-foot wide road section to a 22-foot wide section. Twenty-one new street trees are proposed throughout the development, and more than 15 large existing native trees at the top of the slope will remain and be protected. All trees along the slope and in the wetland will remain. Native

trees and shrubs will be planted along the northern slope of the development in an area of degraded riparian vegetation (invasive and non-native species), and trees and shrubs will also be planted along the re-graded hill slope. Trees and shrubs proposed for planting in the riparian area include the following native species: Douglas-fir, big-leaf maple, red alder, vine maple, snowberry, and Nootka rose. A native seed mix will be spread in all disturbed areas, and erosion control measures will be maintained until plants have been established.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

The action area is defined by NOAA Fisheries regulations (50 CFR 402) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The action area is Cedar Creek, mile 0.7, including the streambed, streambank, water column, and 100 feet upstream and 100 feet downstream of the construction area.

Essential habitat features for salmonids are: Substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions. The proposed action may affect the essential habitat features of water quality and riparian vegetation. Cedar Creek within the action area serves as a rearing and migration area for listed salmonids.

The listing status and biological information for UWR steelhead is provided in Busby *et al.* (1996). An updated status review of each of these ESUs is provided in a draft document titled "Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead," drafted by the West Coast Salmon Biological Review Team (BRT) (NOAA Fisheries 2003).

The Tualatin River in the area of the proposed action serves as a migration area for both adult and juvenile UWR steelhead. It may also serve as a feeding and rearing area juvenile steelhead. Essential habitat features for salmonids are: Substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions. The proposed action may affect the essential habitat features of water velocity, riparian vegetation and water quality as it pertains to rearing and migration of juveniles.

<u>Upper Willamette River Steelhead</u>
All steelhead in this evolutionarily significant unit (ESU) must pass Willamette Falls. Two groups of winter steelhead currently exist in the Upper Willamette River. The "late-run" winter steelhead exhibit the historical phenotype adapted to passing the seasonal barrier at Willamette Falls. The falls were laddered and hatchery "early-run" winter steelhead fish were released above the falls. The early-run fish were derived from Columbia Basin steelhead outside the

Willamette River and are considered non-native. The release of winter-run hatchery steelhead has been discontinued recently, but some early-run winter steelhead are still returning from the earlier hatchery releases and from whatever natural production of the early-run fish has been established. Non-native, summer-run hatchery steelhead are also released into the Upper Willamette River. There are currently no estimates of the absolute total numbers of spawners in the individual populations.

The BRT could not conclusively identify a single population of UWR steelhead that is naturally self-sustaining. All populations are relatively small, with the recent mean abundance of the entire ESU at less than 6,000. Over the period of the available time series, most of the populations are in decline. The recent elimination of the winter-run hatchery production will allow estimation of the natural productivity of the populations in the future, but the available time series are confounded by the presence of hatchery-origin spawners. On a positive note, the counts all indicate an increase in abundance in 2001, likely at least partly as a result of improved marine conditions.

Oregon Department of Fish and Wildlife (2004) surveys and maps and Streamnet (2004) maps indicate that steelhead are present in the project area and utilize the area for rearing and migration.

Upper Willamette River Chinook

All spring chinook in the ESU, except those entering the Clackamas River, must pass Willamette Falls. There is no assessment of the ratio of hatchery-origin to wild-origin chinook passing the falls, but the majority of fish are undoubtedly of hatchery origin. (Natural-origin fish are defined has having had parents that spawned in the wild as opposed to hatchery -origin fish whose parents spawned in a hatchery.)

No formal trend analyses were conducted on any of the UWR chinook populations. The two populations with long time series of abundance (Clackamas and McKenzie) have insufficient information on the fraction of hatchery-origin spawners to permit a meaningful analysis. In general the majority of the populations in this ESU are extirpated or nearly so or are considered not self-sustaining. The exceptions are the Clackamas and McKenzie Rivers.

Oregon Department of Fish and Wildlife (2004) surveys and maps and Streamnet (2004) maps indicate that there are no chinook present in the project area or downstream of the project area. The project area may have been historic habitat for chinook.

2.1.2 Evaluating Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402. NOAA Fisheries must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. This analysis involves the initial steps of: (1) Defining the biological requirements and current

status of the listed species; and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and (3) any cumulative effects. If NOAA Fisheries finds that the action is likely to jeopardize the listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

NOAA Fisheries also evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' critical habitat. NOAA Fisheries must determine whether habitat modifications appreciably diminish the value of critical habitat for both survival and recovery of the listed species. NOAA Fisheries identifies those effects of the action that impair the function of any essential element of critical habitat. NOAA Fisheries then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery.

For the proposed action, NOAA Fisheries' jeopardy analysis considers direct or indirect mortality of fish attributable to the action. NOAA Fisheries' analysis considers the extent to which the proposed action impairs the function of essential elements necessary for migration, spawning, and rearing of listed species under the existing environmental baseline.

2.1.3 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmonids is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species, taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species for ESA protection and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for the listed species to survive and recover to a naturally-reproducing population level, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful rearing and migration. The current status of the listed species, based on their risk of extinction, has not significantly improved since the species were listed.

2.1.4 Environmental Baseline

The Tualatin River is the most northern tributary within the Willamette River Watershed. It enters the Willamette River at river mile 28.5. The Tualatin River is about 80 miles long and has four large elevation drops at Ki-a-cuts Falls, Haines Falls, Lee Falls and Little Lee Falls before it enters the Tualatin Valley plain at an elevation of 120 feet, near Cherry Grove. The Tualatin River drainage basin is approximately 43 miles long and 29 miles wide and covers an area of 712 square miles. The Tualatin River has eight large tributaries: Wapato Creek which drains from the Chehalem Mountains; Scoggins and Gales Creeks which drain part of the Coast Range; Dairy and Rock Creeks drain the Tualatin Mountains; McFee and Chicken Creeks drain the northeast slopes of the Chehelem Mountains and Fanno Creek drains the valley floor and Portland's west hills.

The basin is utilized for both agriculture and urbanized development. As the Portland Metropolitan area sprawls, Washington County in the Tualatin River basin continues to see rapid growth of residential and commercial structures and associated infrastructure. Approximately 31% and 21% of the basin are used for agriculture and urban development, respectively (TWRC 2004).

At present, salmonid fisheries in the Tualatin Watershed are depressed as compared with historic diversity and run size. The factors that limit salmonids in the watershed include: (1) Poor habitat (low water velocity, high amounts of silt/organic substrate, and low hydraulic diversity in the river and tributaries); (2) degraded water quality; (3) low summer flows; (4) high summer water temperatures; and (5) predation by warm water species (TRWC 2004). These factors may also cause salmonid usage to be restricted during the summer and early fall months in some streams. In general, salmonids appear to be more abundant in the upper reaches of streams where better physical habitat and water quality exist. The lower reaches are dominated by introduced warm-water species, which are typically more tolerant to habitat degradation.

The following is a description of the project area, as stated in the BA: The project site is composed of approximately 4 acres of uplands, with 4.2 acres of emergent wetland beside Cedar Creek delineated on the north and east parts of the site. Cedar Creek flows north and northwest across the eastern and north central portion of the property. The wetland is characterized as a broad, emergent floodplain wetland dominated by reed canarygrass and continues off-site to both the east and south. Vegetation diversity increases along the southern and western wetland boundaries, where native woodland communities occur. Fringing wetlands in these areas were dominated by hydrophytic plants including red alder, willow, red-osier dogwood, Pacific ninebark, skunk cabbage, marsh hedgenettle, and creeping buttercup.

A distinct topographic break separates uplands in the north, south and west from the emergent wetland. Vegetation to the north of the wetland is dominated by Himalayan blackberry, and vegetation to the south and west of the wetland is dominated by Douglas-fir, big-leaf maple, red alder, beaked hazelnut, Indian plum, sword fern, and Pacific waterleaf. Cedar Creek flows through two, approximately 8-foot diameter corrugated metal pipes under a under a gravel road

in the northwest portion of the site. Development is proposed only in the upland portion of the site, with minimal impacts to the wetland buffer. Only the sewerline and stormwater discharge will impact the wetland.

Residential development is present north of the wetland and west of the proposed development site south and west of Cedar Creek. On-site structures include a house along Edy Road to the north of the wetlands, and a barn on the upland portion of the site to the south and west of the wetlands. The proposed development will tie into the existing roads in the residential development to the west.

2.1.5 Analysis of Effects

The proposed action includes construction of a sewer line and stormwater facilities, requiring general construction, handling and salvage of fish and stormwater treatment. Potential effects of the proposed action on listed salmonids include the potential for short-term construction effects of direct take, harm, or disturbance during in-water work, and indirect long-term effects of degraded water quality from stormwater runoff associated with the interrelated/interdependent upland residential development.

Turbidity from Construction

The effects of suspended sediment and turbidity on fish, as reported in the literature, range from beneficial to detrimental. Elevated total suspended solids (TSS) conditions have been reported to enhance cover conditions, reduce piscivorus fish/bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish are the frequency and the duration of the exposure, not just the TSS concentration.

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Birtwell *et al.* 1984, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (Sigler *et al.* 1984, Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, unless the fish need to traverse these streams along migration routes (Lloyd, 1987).

Turbidity caused by this project is expected to be minor, local, and short-term because the work area will be isolated from the creek.

Fish Salvage

The most lethal biological effects of the proposed action on individual listed salmon will likely be caused by the isolation of in-water areas. Although work area isolation is a conservation measure intended to reduce the adverse effects of erosion and runoff on the population, any individual fish present in the work isolation area will be captured and released. Capturing and handling fish causes them stress, though they typically recover fairly rapidly from the process and therefore the overall effects of the procedure are generally short-lived (NMFS 2002). The

primary contributing factors to stress and death from handling are differences in water temperatures (between the river and wherever the fish are held), dissolved oxygen concentrations, the amount of time that fish are held out of the water, and physical trauma. Stress on salmonids increases rapidly from handling if the water temperature exceeds 18°C or dissolved oxygen is below saturation. These biological effects will be minimized or avoided by the following conservation measures:

- Any listed fish that may be trapped within the isolated work area will be captured and released using methods approved by NOAA Fisheries, including supervision by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish.

- If electrofishing is needed, NOAA Fisheries' backpack electrofishing guidelines will be followed.[1]

Due to the proposed timing of the work, NOAA Fisheries anticipates that potentially two individual steelhead may be captured and handled during salvage operations, which may prove fatal to some animals.

Stormwater

Land conversions significantly influence hydrologic processes, increasing the magnitude, frequency and duration of peak discharges and reducing summer base flows (Booth 1991). These changes occur because of a loss of forest cover, and an increase in the impervious surface, and a replacement of the natural drainage system with an artificial network of storm pipes, drainage ditches, and roads (Lucchetti and Fuerstenberg 1993, Booth and Jackson 1997). Roads provide a direct drainage pathway for runoff into the stream system and storm sewer outfalls. Reductions in the natural drainage network and increases in artificial drainage systems shrink the lag time between a rainfall event and the point of peak discharge of stormwater into a stream (Booth and Jackson 1997). This reduction often equates to heightened stormwater peak discharges which cause streambed and streambank scour, mobilize and remove large wood, and extend durations of channel forming flows. This change to the natural hydrology of the stream can have adverse effects on all life stages of salmonids, however, rearing juveniles are particularly vulnerable to being swept downstream during high flows and flows of extended durations.

The increased impervious cover of urbanized watersheds also alters the pathway of water to streams. As functional vegetation is removed, evapotranspiration (evaporation of water from plant surfaces and transpiration of water from the soil by plants) can be decreased by 50% or more, resulting in increased runoff volume. Infiltration is reduced as soils are stripped of vegetation, compacted and/or paved, and impervious cover increases. This decrease in infiltration often results in a decrease of stream base flows, adversely affecting salmonids who utilize streams during the summer.

[1] http://www.nwr.noaa.gov/1salmon/salmesa/4ddocs/final4d/electro2000.pdf

Water quality can be significantly affected by stormwater runoff. Nutrients, chemicals and metals are potentially widespread in the environment, and surface and groundwaters may be affected by activities that occur with increased development in a basin. In urban streams during storm events, nitrogen and phosphorus are available in some instances at levels that equal or exceed that of sewage effluent (Pitt and Bozeman 1980), with the annual export of nitrogen and orthophosphate from urban streams being 8 and 3 times greater, respectively, than in streams draining forested watersheds (Omernick 1977). This increase in nitrogen and phosphorus comes primarily from wastewater discharges and fertilizer use, and the result can be increased primary productivity elevated to nuisance levels, increasing oxygen demand and decreasing DO levels in the stream. Pesticides are often detected in urban streams at concentrations that frequently exceed guidelines for the protection of aquatic biota (USGS 1999a, Hoffman *et al.* 2000). Sublethal effects, such as neurological behavioral effects stemming from standard rates of application of pesticides area a concern. Natural metal concentrations in surface water vary regionally, however, a common feature of urban streams is elevated water column and sediment metal concentrations, including lead, zinc, chromium, copper, manganese, nickel, and cadmium, which increase with increased percentages of urban land use (Wilber and Hunter 1979). In addition to industrial discharges, other sources of metals are brake linings, tires, and metal alloys for engine parts. Although some metals are necessary trace nutrients, many metals are toxic to fish at very low concentrations (Spence *et al.* 1996).

The proposed project includes a bioswale designed to treat the NOAA Fisheries water quality design storm,[2] measuring 125 feet long and 14 feet wide. This swale is designed to remove low concentrations of total suspended solids, metals, petroleum hydrocarbons, and nutrients from stormwater. The proposed water quality facility maintenance plan will be followed to insure the facility is functioning properly and efficiently. Additionally, 21 street trees are proposed within the development and, to minimize total impervious surface proposed for the project, the width of the streets has been reduced from 32 feet to 22 feet. Detention is not proposed for the project since the percent of increase to peak flow in Cedar Creek is 0.10 % and site constraints prevent construction of a detention area. The small increase in flow from the project is not expected to significantly affect listed species.

Riparian Vegetation

To the extent that vegetation is providing habitat function, such as delivery of large wood, particulate organic matter, or shade to a riparian area and stream, root strength for slope and bank stability, and/or sediment filtering and nutrient absorption from runoff, removal of that vegetation for construction will reduce or eliminate those habitat values (Darnell 1976, Spence *et al.* 1996). Denuded areas lose organic matter and dissolved minerals such as nitrates and phosphates. Microclimate can become drier and warmer with corresponding increases in wind speed, and soil and water temperature. Water tables and spring flow can be reduced. Loose soil can temporarily accumulate in the construction area. In dry weather, this soil can be dispersed as dust. In wet weather, loose soil is transported to streams by erosion and runoff, particularly in

[2] http://www.nwr.noaa.gov/1habcon/habweb/habguide/stormwater_032003.pdf

steep areas. Erosion and runoff increase the supply of soil to lowland drainage areas and eventually to aquatic habitats where they increase water turbidity and sedimentation. This combination of erosion and mineral loss can reduce soil quality and site fertility in upland and riparian areas.

Removal of vegetation will be limited to the construction area needed to complete the project. Trees will not be planted along the sewer line to avoid damage to the pipe from roots. An eroding slope downslope of the bioswale will be re-graded to a 2:1 slope, stabilized, and revegetated with native vegetation. As the vegetation matures, sediment loading to Cedar Creek from the unstable slopes will be eliminated, thus improving water quality.

2.1.5.1 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation."

NOAA Fisheries is not aware of any specific future non-federal activities within the action area that would cause greater effects to listed species than presently occurs. Between 1990 and 2000, the population of Washington County increased by 42.9%.[3] Thus, NOAA Fisheries assumes that future private and state actions will continue within the action area, increasing as population density rises. As the human population in the state continues to grow, demand for actions similar to the subject project likely will continue to increase as well. Each subsequent action may have only a small incremental effect, but taken together they may have a significant effect that would further degrade the watershed's environmental baseline and undermine the improvements in habitat conditions necessary for listed species to survive and recover.

2.1.6 Conclusion

NOAA Fisheries has determined that, based on the available information, the proposed action is not likely to jeopardize the continued existence of listed species nor result in the destruction or adverse modification of critical habitat. NOAA Fisheries used the best available scientific and commercial data to analyze the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects.

These conclusions are based on the following considerations: (1) The installation will be made during the recommended in-water work window of June 1 to September 30, when the fewest numbers of listed species are likely to be present; (2) the work area will be isolated from the creek; (3) fish will be salvaged and handled according to NOAA Fisheries' guildelines; (4) stormwater runoff will be treated for water quality; (5) the eroding slope will be reshaped and vegetated to eliminate sediment loading; and (6) with minimization measures incorporated into

[3] U.S. Census Bureau, State and County Quickfacts, Coos County, Oregon. Available at http://quickfacts.census.gov/qfd/states/41/41051.html

the project design, the proposed action is not likely to impair properly functioning habitat, or retard the long-term progress of impaired habitat toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

2.1.7 Reinitiation of Consultation

Consultation must be reinitiated if: (1) The amount or extent of taking specified in the incidental take statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

2.2 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 CFR 222.102] Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." [50 CFR 17.3] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

An incidental take statement specifies the impact of any incidental taking of listed species. It also provides reasonable and prudent measures that are necessary to minimize the effects of take and sets forth non-discretionary terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of the Take

NOAA Fisheries anticipates that the actions covered by this Opinion are reasonably certain to result in incidental take of listed species because of potential adverse effects from decreased water quality due to turbidity from construction and stormwater runoff and salvage and handling of individuals. NOAA Fisheries anticipates that 2 individual UWR steelhead may be injured or killed by this salvage and handling process. Even though NOAA Fisheries expects some low level of incidental take to occur due to harassment and harm (turbidity from construction and

stormwater runoff) caused by the actions covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take to the species itself. In instances such as these, NOAA Fisheries designates the expected amount of take as "unquantifiable." Based on the information provided by the COE and other available information, NOAA Fisheries anticipates that an unquantifiable amount of incidental take could occur as a result of the action covered by this Opinion.

The extent of the take is limited to disturbance resulting from construction activities within the action area. The action area is Cedar Creek including the streambed, streambank, water column at mile 0.7 and 100 feet upstream and 100 feet downstream of the construction area.

2.2.2 Reasonable and Prudent Measures

The measures described below are non-discretionary. They must be implemented so that they become binding conditions in order for the exemption in section 7(a)(2) to apply. The COE has the continuing duty to regulate the activities covered in this incidental take statement. If the COE fails to adhere to the terms and conditions of the incidental take statement through enforceable terms added to the document authorizing this action, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(a)(2) may lapse.

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to avoid or minimize take of listed salmonid species resulting from the action covered by this Opinion.

The COE shall include measures that will:

1. Ensure completion of a comprehensive monitoring and reporting program to confirm this Opinion is meeting its objective of minimizing take from permitted activities.

2. Avoid or minimize incidental take from construction-related activities by applying permit conditions that require completion of construction, operation and maintenance actions with minimum harm to aquatic and riparian systems.

2.2.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the COE must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity.

1. To implement reasonable and prudent measure #1 (monitoring), the COE shall ensure that:

    a. Salvage notice. The following notice is included as a permit condition:

NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NOAA Fisheries Law Enforcement at 360.418.4246. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

b. Written planning requirements. Before beginning any work below bankfull elevation,[4] the permittee will provide a copy of the written plans for site restoration and pollution and erosion control to the Oregon State Habitat Office of NOAA Fisheries at the following address. Plan requirements are described below.

Director, Oregon State Habitat Office
Habitat Conservation Division
National Marine Fisheries Service
Attn: 2003/01042
525 NE Oregon Street
Portland, OR 97232

c. Implementation monitoring report required. The permittee submits an implementation monitoring report to the COE and to NOAA Fisheries, at the address below, within 120 days of completing all in-water work. The monitoring report will describe the permittee's success meeting his or her permit conditions.

i. If the in-water work will not be completed by January 31 following the year during which consultation was completed, the permittee shall submit a report to the COE and to NOAA Fisheries by January 31 saying why the in-water work was not complete.

ii. If the monitoring report or explanation of why work was not completed is not received by the COE and NOAA Fisheries by January 31, NOAA Fisheries may consider that a modification of the action that causes an effect on listed species not previously considered and causes the incidental take statement of the Opinion to expire.

[4] 'Bankfull elevation' means the bank height inundated by a 1.5 to 2-year average recurrence interval and may be estimated by morphological features such average bank height, scour lines and vegetation limits.

iii. Submit a copy of the monitoring report or explanation of why work was not completed to the Oregon State Habitat Office of NOAA Fisheries, at the address above.

d. Implementation monitoring report contents. Each monitoring report will include the following information.

i. Project identification

(1) Permittee name, permit number, and project name.

(2) Project location, including any compensatory mitigation site(s), by 5th field HUC and by latitude and longitude as determined from the appropriate USGS 7-minute quadrangle map.

(3) COE contact person.

(4) Starting and ending dates for work completed.

ii. Habitat conditions. Photos of habitat conditions at the project and any compensation site or sites, before, during, and after project completion.[5]

(1) Include general views and close-ups showing details of the project and project area, including pre and post construction.

(2) Label each photo with date, time, project name, photographer's name, and a comment about the subject.

iii. Project data.

(1) Work cessation. Dates work ceased due to high flows, if any.

(2) Fish screen. Evidence of compliance with NOAA Fisheries' fish screen criteria.

(3) Pollution control. A summary of pollution and erosion control inspections, including any erosion control failure, contaminant release, and correction effort.

(4) Site preparation.

(a) Total cleared area – riparian and upland.

(b) Total new impervious area.

(5) Isolation of in-water work area, capture and release.

(a) Supervisory fish biologist – name and address.

(b) Methods of work area isolation and take minimization.

(c) Stream conditions before, during and within one week after completion of work area isolation.

(d) Means of fish capture.

(e) Number of fish captured by species.

(f) Release site and condition of all fish released.

(g) Any incidence of observed injury or mortality of listed species.

(6) Site restoration. Photo or other documentation that site restoration performance standards were met.

[5] Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

e. Reinitiation contact. To reinitiate consultation, contact the Oregon State Habitat Office of NOAA Fisheries, at the address above.

2. To implement reasonable and prudent measure #2 (construction-related activities), the COE shall:

a. Site restoration and compensatory mitigation. Ensure that the permittee successfully completes site restoration.

b. Site restoration. Prepare and carry out a written site restoration plan as necessary to ensure that all streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows. Submit a copy of the written site restoration plan to the COE and to the Oregon State Habitat Office of NOAA Fisheries, at the address above, before beginning work below bankfull elevation.

i. General considerations.

(1) Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (*e.g.*, large woody debris), channel conditions, flows, watershed conditions, and other ecosystem processes that form and maintain productive fish habitats.

(2) Streambank shaping. Restore damaged streambanks to a natural slope, pattern, and profile suitable for establishment of permanent woody vegetation, unless precluded by pre-project conditions (*e.g.*, a natural rock wall).

(3) Revegetation. Replant each area requiring revegetation before the first April 15 following construction. Use a diverse assemblage of species native to the project area or region, including grasses, forbs, shrubs, and trees. Noxious or invasive species may not be used.

(4) Pesticides. Take of ESA-listed species caused by any aspect of pesticide use is not included in the exemption to the ESA take prohibitions provided by this incidental take statement. Pesticide use must be evaluated in an individual consultation, although mechanical or other methods may be used to control weeds and unwanted vegetation.

(5) Fertilizer. Do not apply surface fertilizer within 50 feet of any stream channel.

(6) Fencing. Install fencing as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

ii. Plan contents. Include each of the following elements.

(1) Responsible party. The name and address of the party(s) responsible for meeting each component of the site restoration requirements, including providing and managing any financial assurances and monitoring necessary to ensure restoration success.

(2) Baseline information. This information may be obtained from existing sources (*e.g.*, land use plans, watershed analyses, subbasin plans), where available.
   (a) A functional assessment of adverse effects, *i.e.*, the location, extent and function of the riparian and aquatic resources that will be adversely affected by construction and operation of the project.
   (b) The location and extent of resources surrounding the restoration site, including historic and existing conditions.

(3) Goals and objectives. Restoration goals and objectives that describe the extent of site restoration necessary to offset adverse effects of the project, by aquatic resource type.

(4) Performance standards. Use these standards to help design the site restoration plan and to assess whether the restoration goal is met. While no single criterion is sufficient to measure success, the intent is that these features should be present within reasonable limits of natural and management variation.
   (a) Bare soil spaces are small and well dispersed.
   (b) Soil movement, such as active rills or gullies and soil deposition around plants or in small basins, is absent or slight and local.
   (c) If areas with past erosion are present, they are completely stabilized and healed.
   (d) Plant litter is well distributed and effective in protecting the soil with few or no litter dams present.
   (e) Native woody and herbaceous vegetation, and germination microsites, are present and well distributed across the site.
   (f) Vegetation structure is resulting in rooting throughout the available soil profile.
   (g) Plants have normal, vigorous growth form, and a high probability of remaining vigorous, healthy and dominant over undesired competing vegetation.
   (h) High impact conditions confined to small areas necessary access or other special management situations.
   (i) Streambanks have less than 5% exposed soils with margins anchored by deeply rooted vegetation or coarse-grained alluvial debris.
   (j) Few upland plants are in valley bottom locations, and a continuous corridor of shrubs and trees provide shade for the entire streambank.

(5) Work plan. Include a written work plan as part of the site restoration plan with sufficient detail to include a description of the following elements, as applicable.
   (a) Boundaries for the restoration area.

(b) Restoration methods, timing, and sequence.
(c) Water supply source, if necessary.
(d) Woody native vegetation appropriate to the restoration site.[6] This must be a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs and trees. This may include allowances for natural regeneration from an existing seed bank or planting.
(e) A plan to control exotic invasive vegetation.
(f) Elevation(s) and slope(s) of the restoration area to ensure they conform with required elevation and hydrologic requirements of target plant species.
(g) Geomorphology and habitat features of stream or other open water.
(h) Site management and maintenance requirements.

(6) Five-year monitoring and maintenance plan.
(a) A written schedule to visit the restoration site annually for five years or longer as necessary to confirm that the performance standards are achieved. Despite the initial five-year planning period, site visits and monitoring will continue from year-to-year until the COE certifies that site restoration performance standards have been met.
(b) During each visit, inspect for and correct any factors that may prevent attainment of performance standards (*e.g.*, low plant survival, invasive species, wildlife damage, drought).
(c) Keep a written record to document the date of each visit, site conditions and any corrective actions taken.

c. Minimum area. Confine construction impacts to the minimum area necessary to complete the project.

d. Timing of in-water work. Complete all work below the bankfull elevation between July 1 and September 30, unless otherwise approved in writing by NOAA Fisheries.

e. Cessation of work. Cease project operations under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

f. Fish screens. Install, operate and maintain a fish screen according to NOAA Fisheries' fish screen criteria[7] on each water intake used for project construction, including pumps used to isolate an in-water work area. Screens for water

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[6] Use references sites to select vegetation for the mitigation site whenever feasible. Historic reconstruction, vegetation models, or other ecologically-based methods may also be used as appropriate.

[7] National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

diversions or intakes that will be used for irrigation, municipal or industrial purposes, or any use besides project construction are not authorized.

g. Fish passage. Provide passage for any adult or juvenile salmonid species present in the project area during construction, unless otherwise approved in writing by NOAA Fisheries, and after construction for the life of the project. Upstream passage is not required during construction if it did not previously exist.

h. Pollution and Erosion Control Plan. Prepare and carry out a written pollution and erosion control plan to prevent pollution caused by surveying or construction operations. Submit a copy of the written plan to the COE and to the Oregon State Habitat Office of NOAA Fisheries, at the address above, before beginning work below bankfull elevation.

   i. Plan Contents. The pollution and erosion control plan will contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

      (1) The name and address of the party(s) responsible for accomplishment of the pollution and erosion control plan.

      (2) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, drilling sites, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations, staging areas, and roads being decommissioned.

      (3) Practices to confine, remove and dispose of excess concrete, cement, grout, and other mortars or bonding agents, including measures for washout facilities.

      (4) A description of any regulated or hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

      (5) A spill containment and control plan with notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

      (6) Practices to prevent construction debris from dropping into any stream or waterbody, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

   ii. Inspection of erosion controls. During construction, monitor instream turbidity and inspect all erosion controls daily during the rainy season and weekly during the dry season, or more often as necessary, to ensure the erosion controls are working adequately.[8]

[8] 'Working adequately' means that project activities do not increase ambient stream turbidity by more than 10% above background 100 feet below the discharge, when measured relative to a control point immediately upstream of the turbidity causing activity.

(1) If monitoring or inspection shows that the erosion controls are ineffective, mobilize work crews immediately to make repairs, install replacements, or install additional controls as necessary.

(2) Remove sediment from erosion controls once it has reached 1/3 of the exposed height of the control.

i. Construction discharge water. Treat all discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water, drilling fluids) as follows:

i. Water quality. Design, build and maintain facilities to collect and treat all construction discharge water, including any contaminated water produced by drilling, using the best available technology applicable to site conditions. Provide treatment to remove debris, nutrients, sediment, petroleum hydrocarbons, metals, and other pollutants likely to be present.

ii. Discharge velocity. If construction discharge water is released using an outfall or diffuser port, velocities may not exceed 4 feet per second, and the maximum size of any aperture may not exceed 1 inch.

iii. Pollutants. Do not allow pollutants including green concrete, contaminated water, silt, welding slag, sandblasting abrasive, or grout cured less than 24 hours to contact any wetland or the two-year floodplain.

j. Preconstruction activity. Complete the following actions before significant[9] alteration of the project area.

i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite.

(1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[10]).

(2) An oil-absorbing, floating boom whenever surface water is present.

iii. Temporary erosion controls. All temporary erosion controls will be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

k. Temporary access roads and drilling pads. All temporary access roads and drilling pads will be constructed as follows:

i. Existing ways. Use existing roadways, travel paths, and drilling pads whenever possible, unless construction of a new way or drilling pad would result in less habitat take. When feasible, eliminate the need for an access

[9] 'Significant' means an effect can be meaningfully measured, detected or evaluated.

[10] When available, certified weed-free straw or hay bales will be used to prevent introduction of noxious weeds.

road by walking a tracked drill or spider hoe to a survey site, or lower drilling equipment to a survey site using a crane.

ii. Steep slopes. Temporary roads or drilling pads built mid-slope or on slopes steeper than 30% are not authorized.

iii. Minimizing soil disturbance and compaction. Minimize soil disturbance and compaction whenever a new temporary road or drill pad is necessary within 150 feet[11] of a stream, waterbody or wetland by clearing vegetation to ground level and placing clean gravel over geotextile fabric, unless otherwise approved in writing by NOAA Fisheries.

iv. Obliteration. When the project is complete, obliterate all temporary access roads that will not be in footprint of a new bridge or other permanent structure, stabilize the soil, and revegetate the site. Abandon and restore temporary roads in wet or flooded areas by the end of the in-water work period.

l. Heavy Equipment. Restrict use of heavy equipment as follows:

i. Choice of equipment. When heavy equipment will be used, the equipment selected will have the least adverse effects on the environment (*e.g.*, minimally-sized, low ground pressure equipment).

ii. Vehicle and material staging. Store construction materials, and fuel, operate, maintain, and store vehicles as follows.

(1) To reduce the staging area and potential for contamination, ensure that only enough supplies and equipment to complete a specific job will be stored on-site.

(2) Complete vehicle staging, cleaning, maintenance, refueling, and fuel storage in a vehicle staging area placed 150 feet or more from any stream, waterbody or wetland, unless otherwise approved in writing by NOAA Fisheries.

(3) Inspect all vehicles operated within 150 feet of any stream, waterbody or wetland daily for fluid leaks before leaving the vehicle staging area. Repair any leaks detected in the vehicle staging area before the vehicle resumes operation. Document inspections in a record that is available for review on request by COE or NOAA Fisheries.

(4) Before operations begin and as often as necessary during operation, steam clean all equipment that will be used below bankfull elevation until all visible external oil, grease, mud, and other visible contaminates are removed.

[11] Distances from a stream or waterbody are measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. 'Channel migration zone' means the area defined by the lateral extent of likely movement along a stream reach as shown by evidence of active stream channel movement over the past 100 years (*e.g.*, alluvial fans or floodplains formed where the channel gradient decreases, the valley abruptly widens, or at the confluence of larger streams).

(5) Diaper all stationary power equipment (*e.g.*, generators, cranes, stationary drilling equipment) operated within 150 feet of any stream, waterbody or wetland to prevent leaks, unless suitable containment is provided to prevent potential spills from entering any stream or waterbody.

m. Site preparation. Conserve native materials for site restoration.
   i. If possible, leave native materials where they are found.
   ii. If materials are moved, damaged or destroyed, replace them with a functional equivalent during site restoration.
   iii. Stockpile any large wood,[12] native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site restoration.

n. Isolation of in-water work area. If adult or juvenile fish are reasonably certain to be present, or if the work area is 300 feet upstream of spawning habitats, completely isolate the work area from the active flowing stream using inflatable bags, sandbags, sheet pilings, or similar materials, unless otherwise approved in writing by NOAA Fisheries.

o. Capture and release. Before and intermittently during pumping to isolate an in-water work area, attempt to capture and release fish from the isolated area using trapping, seining, electrofishing, or other methods as are prudent to minimize risk of injury.
   i. The entire capture and release operation must be conducted or supervised by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish.
   ii. Do not use electrofishing if water temperatures exceed 18ºC.
   iii. If electrofishing equipment is used to capture fish, comply with NOAA Fisheries' electrofishing guidelines.[13]
   iv. Handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.
   v. Transport fish in aerated buckets or tanks.
   vi. Release fish into a safe release site as quickly as possible, and as near as possible to capture sites.
   vii. Do not transfer ESA-listed fish to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries.

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[12] For purposes of this Opinion only, 'large wood' means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull channel width of the stream in which the wood occurs. See, Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (www.odf.state.or.us/FP/RefLibrary/LargeWoodPlacemntGuide5-95.doc).

[13] National Marine Fisheries Service, *Backpack Electrofishing Guidelines* (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

viii. Obtain all other Federal, state, and local permits necessary to conduct the capture and release activity.

ix. Allow NOAA Fisheries or its designated representative to accompany the capture team during the capture and release activity, and to inspect the team's capture and release records and facilities.

p. Earthwork. Complete earthwork (including drilling, excavation, dredging, filling and compacting) as quickly as possible.

i. Drilling and sampling. If drilling, boring or jacking is used, the following conditions apply.

(1) Isolate drilling operations in wetted stream channels using a steel pile, sleeve or other appropriate isolation method to prevent drilling fluids from contacting water.

(2) If it is necessary to drill through a bridge deck, use containment measures to prevent drilling debris from entering the channel.

ii. Site stabilization. Stabilize all disturbed areas, including obliteration of temporary roads, following any break in work unless construction will resume within four days.

iii. Source of materials. Obtain boulders, rock, woody materials and other natural construction materials used for the project outside the riparian area.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance essential fish habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2)).

- NOAA Fisheries must provide conservation recommendations for any Federal or state action that would adversely affect EFH (§305(b)(4)(A)).

- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10), and "adverse effect" means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

EFH consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

3.2 Identification of EFH

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for Federally-managed fisheries within the waters of Washington, Oregon, and California. Designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (370.4 km) (PFMC 1998a, 1998b). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999). In estuarine and marine areas, designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border (PFMC 1999).

Detailed descriptions and identifications of EFH are contained in the fishery management plans for groundfish (PFMC 1998a), coastal pelagic species (PFMC 1998b), and Pacific salmon (PFMC 1999). Casillas *et al.* (1998) provides additional detail on the groundfish EFH habitat complexes. Assessment of the potential adverse effects to these species' EFH from the proposed action is based, in part, on these descriptions and on information provided by the COE.

3.3 Proposed Actions

The proposed action and action area are detailed above in sections 1.2 and 1.3 of this Opinion. The action area includes habitats that have been designated as EFH for various life-history stages of chinook and coho salmon. The project area is classified as currently accessible, but unutilized historic habitat for chinook.

3.4 Effects of Proposed Action

As described in detail in section 2.1.5 of this document, the proposed action will result in short-term adverse effects to a variety of habitat parameters. NOAA Fisheries believes that the proposed action will cause a minor, short-term degradation of anadromous salmonid habitat due to decreased water quality. Minimization measures will be incorporated into the construction methods to reduce adverse impacts to EFH.

3.5 Conclusion

NOAA Fisheries concludes that the proposed action will adversely affect the EFH for chinook and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. While NOAA Fisheries understands that the conservation measures described in the BA will be implemented by the COE it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. However, the terms and conditions outlined in section 2.2.3 are generally applicable to designated EFH for the species designated in section 3.3, and address these adverse effects. Consequently, NOAA Fisheries incorporates them here as EFH conservation recommendations.

3.7 Statutory Response Requirement

Pursuant to the MSA (§305(b)(4)(B)) and 50 CFR 600.920(j), Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

3.8 Supplemental Consultation

The COE must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920(k)).

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